

9 the cross-section of the chamber in a plane perpendicular to the direction of
10 movement is larger at the first position than at the second position,

11 the change of the cross-section of the chamber is essentially continuous between
12 the first position and the second position and

13 the cross-section of the chamber is arranged to adapt itself to the cross-section of
14 the piston.

1 3. A device comprising a combination of a chamber and a piston positioned
2 inside the chamber, said chamber and said piston relatively movable to each other in a
3 predetermined direction of movement between a first position and a second position,
4 wherein

5 the cross-section of the piston in a plane perpendicular to the direction of
6 movement is larger at a first piston position than at a second piston position,

7 the change of the cross-section of the piston is essentially continuous between the
8 first piston position and the second piston position,

9 the cross-section of the chamber in a plane perpendicular to the direction of
10 movement is larger at the first position than at the second position,

11 the change of the cross-section of the chamber is essentially continuous between
12 the first position and the second position and

13 a cross-section of the chamber and the piston respectively is arranged to adapt
14 itself to the cross-section of the piston and the chamber, respectively.

1 4. The device comprising a combination of a chamber and a piston of Claim
2 1 wherein the circumference of the cross-section perpendicular to the direction of
3 movement of the chamber and/or the piston where at least one part of said chamber
4 and/or said piston, is constant between and including said first position and said second
5 position.

1 5. The device comprising a combination of a chamber and a piston according
2 to claim 4, wherein said cross-section

3 consisting of sectors, wherein in each sector the distance between the centerpoint
4 of the cross-section of the chamber and the outermost limiting surface of the chamber is
5 larger than the corresponding distance measured along a line separating the sector from
6 an adjacent sector, and

7 the change of the shape between two adjacent sectors is essentially continuous.

1 6. The device comprising a combination of a chamber and a piston according
2 to claim 1 wherein the cross-section of the chamber is circular at any point between and
3 including the said first position and second position.


1 7. The device comprising a combination of a chamber and a piston according
2 to claim 1 wherein the piston comprises a sealing portion made of an elastically
3 deformable material and/or a loading portion and/or a support portion.

1 8. The device comprising a combination of a chamber and a piston according
2 to claim 7, wherein the sealing portion in cross-section of the piston parallel to the
3 direction of movement has a general form of an area which is bound by a curve and/or
4 line with specific predetermined mathematical characteristics in which the said adaptation
5 of the cross-section of said piston in a plane perpendicular to the direction of movement
6 corresponds to a change in a value of a characteristic in a direction perpendicular and/or
7 in a direction of the movement of said piston and/or said chamber.

1 9. The device comprising a combination of a chamber and a piston according
2 to claim 8, wherein the sealing portion in a cross-section of the piston in a plane parallel
3 to the direction of movement has the general form of an area bounded by a rectangular
4 having a predetermined length of its sides, in which the said adaptation of the cross-
5 section of the piston in a plane perpendicular to the direction of movement corresponds to
6 a change in the length of a side of said rectangular perpendicular to the direction of
7 movement and is accompanied by an opposite change in the length of a side along the
8 direction of movement.

1 10. The device comprising a combination of a chamber and a piston according
2 to claim 9, wherein the change of the length of said side along the direction of movement
3 is accompanied by a change in the shape of said rectangular.

1 11. The device comprising a combination of a chamber and a piston according
2 to claim 8, wherein the sealing portion in a cross-section of the piston in a plane parallel
3 to the direction of movement has the general form of the obliques of a triangle of which
4 its perpendicular being parallel with the direction of movement, the obliques of said
5 triangle extending outwards from said perpendicular in a predetermined angle (α_1, ϵ_1)
6 wherein the said adaptation of the cross-section of the piston in a plane perpendicular to
7 the direction of movement corresponds to a change in the said predetermined angle ($\alpha_2,$
8 ϵ_2).




1 12. The device comprising a combination of a chamber and a piston according
2 to claim 8, wherein the sealing portion in a cross-section of the piston a plane parallel to
3 the direction of movement has the general form of an area which is bound by
4 approximately a triangle, a perpendicular being parallel to the direction of movement and
5 the obliques of the said triangle extending outwards from said perpendicular in a
6 predetermined angle ϕ_1 , wherein said adaptation of the cross-section of the piston in a
7 plane perpendicular to the direction of movement corresponds to a change in the said
8 predetermined angle ϕ_2 .

1 13. The device comprising a combination of a chamber and a piston according
2 to claim 11, wherein said predefined angle ($\alpha_1, \epsilon_1, \phi_2$) is larger at the first position than at
3 said second position.

1 14. The device comprising a combination of a chamber and a piston according
2 to claim 8, wherein the sealing portion in a cross-section of the piston in a plane parallel
3 to the direction of movement has the general form of an area which is bound by a circle
4 having a predetermined radius, a central axis parallel to the direction of movement and,
5 wherein the said adaptation of the cross-section of the piston in a plane perpendicular to
6 the direction of movement corresponds to a change in the said radius.

1 15. The device comprising a combination of a chamber and a piston according
2 to claim 14, wherein said adaptation is accompanied by an opposite change of the radius
3 in the direction of movement.

1 16. The device comprising a combination of a chamber and a piston according
2 to claim 8, wherein the sealing portion in a cross-section of the piston in a plane parallel
3 to the direction of movement has the general form of an area which is bounded by a
4 rhomboid, which has a predetermined length of its axis, one of the axis parallel to the
5 direction of movement, wherein said adaptation of the cross-section of the piston in a
6 plane perpendicular to the direction of movement corresponds with a change in the length
7 of an axis and an opposite change in the length of the other axis.



1 17. The device comprising a combination of a chamber and a piston according
2 to claim 8, wherein the sealing portion in a cross-section of the piston in a plane parallel
3 to the direction of movement has the general form of an area which is bounded by an
4 ellipse, which has a predetermined length of its axes, one axis parallel to the direction of
5 movement, wherein said adaptation of the cross-section of the piston in a plane
6 perpendicular to the direction of movement corresponds with a change in the length of an
7 axis and an opposite change in the length of the other axis.

1 18. The device comprising a combination of a chamber and a piston according
2 to claim 8, wherein the sealing portion in a cross-section of the piston in a plane parallel
3 to the direction of movement comprises parts (X, Y, Z) which are preformed, having in
4 between predetermined angles (k_1 , λ) where said part X having a predetermined angle η_1
5 with the direction of movement wherein said adaptation of the cross-section of the piston
6 in a plane perpendicular to the direction of movement corresponds with a change in said
7 angles (k_2 , η_2).

1 19. The device comprising a combination of a chamber and a piston according
2 to claim 7, wherein said sealing portion comprise a sealing edge which is engaging the
3 wall of said chamber, wherein said adaptation additionally is accompanied by a change in
4 the size and/or shape of said sealing edge under the influence of said loading means.

1 20. The device comprising a combination of a chamber and a piston according
2 to claim 19, wherein said loading means provides a spring-force to the sealing edge so
3 that said piston engages the wall of the chamber with a sealing force.

1 21. The device comprising a combination of a chamber and a piston according
2 to claim 20, wherein said loading means comprise:

3 a medium,
4 a layer of fibers which can freely shear over each other or a layer of a
5 reinforcement,
6 said fibers are embedded in a skin made of rubber or a thermoplast,
7 positioned inside said piston and/or inside the wall of the chamber which has a
8 predetermined pressure at said first position, and which can have a different pressure at
9 said second position.

1 22. The device comprising a combination of a chamber and a piston according
2 to claim 19 in which said piston is connected to the piston rod for moving the piston in
3 the direction of movement wherein said piston and/or said chamber comprise loading
4 regulating means providing a sealing force

5 which adjusts itself so that the sealing edge seals against the wall of the chamber
6 during said movement between and including said first position and said second position,
7 and

8 said sealing force depends on the relative position of said piston and said chamber
9 and/or on the pressure of a medium in the chamber, and/or the operating force, and/or a
10 spring-force.

1 23. The device comprising a combination of a chamber and a piston according
2 to claim 22 in which said piston is connected to a piston rod for moving the piston in the
3 direction of movement, wherein

4 the piston rod of the piston comprises a channel which is connected by a hole in
5 the wall of said piston rod to a medium of the piston, so that a medium can be conducted
6 through said hole,

7 said channel comprises a piston which is engaging said medium by a spring-force.

1 24. The device comprising a combination of a chamber and a piston according
2 to claim 22 in which said piston is connected to a piston rod for moving the piston in the
3 direction of movement, wherein,

4 the piston rod of said piston comprises a channel which is connected by a hole in
5 the wall of said piston rod to a medium of the piston, so that a medium can be conducted
6 through said hole,

7 a cap which is connecting the piston to said piston rod comprises a stop for
8 preventing said piston to disassemble from said piston rod, and

9 said channel comprises a piston which is engaging said medium by the operational
10 force.

1 25. The device comprising a combination of a chamber and a piston according
2 to claim 22 in which said piston is connected to a piston rod for moving the piston in the
3 direction of movement, wherein

4 the piston rod of the piston comprises a channel which is connected by a hole in
5 the wall of said piston rod to a medium of the piston, so that a medium can be conducted
6 through said hole,

7 said channel comprises a piston which is engaging said medium by a spring-force
8 of a piston which is connected by a piston rod, and which is engaged by a medium in the
9 chamber.

1 26. The device comprising a combination of a piston and a chamber according
2 to claim 1 in which the said piston is connected to the piston rod for moving the piston in
3 the direction of movement, wherein said piston and/or chamber comprise shape
4 regulating means.

1 27. The device comprising a combination of a piston and a chamber according
2 to claim 26, wherein,

3 a cap is movable over the piston rod in a predetermined direction,

4 defined by a stop or a cap which is fastened to the piston rod,

5 a sealing device and/or an impervious layer which is tightly squeezed between (the
6 skin and said caps and sealing device prevent the medium or media to escape from the
7 piston.

1 28. The device comprising a combination of a piston and a chamber according
2 to claim 27, said movement is damped by a spring, and is limited by (a) stop.

1 29. The combination of a piston and a chamber according to claim 1 in which
2 said piston is connected to a piston rod for moving the piston in the direction of
3 movement, wherein:

4 the piston rod comprises an inlet and a channel for conducting pumped gaseous
5 and/or liquid media into the chamber, and

6 the piston rod further comprises a valve for preventing the pumped gaseous and/or
7 liquid media from escaping the chamber through said channel.

1 30. The combination of a piston and a chamber according to claim 1 wherein:
2 the chamber comprises an inlet channel for conducting pumped gaseous and/or
3 liquid media into said chamber, wherein said inlet channel comprises a valve for
4 preventing the pumped gaseous and/or liquid media from escaping the chamber through
5 said inlet channel.

1 31. The device comprising a combination of a chamber and a piston according
2 to claim 1 in which the chamber comprises an outlet channel and/or an inlet channel for
3 conducting pumped gaseous and/or liquid media out of the chamber, wherein the second
4 position is closer to the outlet channel than the first position, so that the cross-section of
5 the chamber diminishes from the first position towards the second position.

1 32. The device comprising a combination of a chamber and a piston according
2 to claim 31, wherein said outlet channel comprises a valve for preventing the pumped
3 gaseous and/or liquid media to be conducted into said chamber.

1 33. The device comprising a combination of a chamber and a piston according
2 to claim 1 in which said piston is connected to a piston rod for moving the piston in the
3 direction of movement, characterized by the fact that said chamber is closed and
4 comprises a medium which is non-compressible, while said piston comprises valve
5 means for conducting the said medium.

1 34. The device comprising a combination of a chamber and a piston according
2 to claim 1 in which said piston is connected to a piston rod for moving the piston in the
3 direction of movement, wherein said chamber is closed and comprises a medium which is
4 compressible between said piston and a wall of said chamber.

1 35. The device comprising a combination of a chamber and a piston according
2 to claim 1 in which said piston is connected to a piston rod for moving the piston in the
3 direction of movement, wherein said device comprises valve means and valve regulating
4 means in order to selectively conduct a medium in or out of the space between said piston
5 and said chamber.

1 36. The device comprising a combination of a chamber and a piston according
2 to claim 1 in which said piston is connected to a piston rod for moving the piston in the
3 direction of movement, wherein said chamber or said piston is connected to an axis in
4 order to transform the translation of the piston and/or the chamber into a rotation, where
5 the chamber comprises valve means and valve regulating means for selectively
6 conducting and not conducting a medium to the space between the said piston and said
7 chamber in order to move said chamber and/or piston.

1 37. The device comprising a combination of a piston and a chamber according
2 to claim 22 wherein the pressure inside the piston and/or inside the wall of the chamber is
3 higher, equal or lower than the pressure in the chamber.

1 38. The device comprising a combination of a piston and a chamber according
2 to claim 22, wherein the pressure inside the piston is higher, equal or lower than the
3 pressure in the wall of the chamber.